(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
1 February 2001 (01.02.2001)

PCT

(10) International Publication Number
WO 01/07586 A2

(51) International Patent Classification[7]: C12N 15/00

(21) International Application Number: PCT/CA00/00860

(22) International Filing Date: 21 July 2000 (21.07.2000)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/145,013 22 July 1999 (22.07.1999) US

(71) Applicant *(for all designated States except US)*: **THE UNIVERSITY OF BRITISH COLUMBIA** [CA/CA]; University-Industry Liaison Office, IRC Building, Room 331, 2194 Health Sciences Mall, Vancouver, British Columbia V6T 1Z3 (CA).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **KUNST, Ljerka** [CA/CA]; 2810 Newmarket Drive, North Vancouver, British Columbia V7R 2T4 (CA). **CLEMENS, Sabine** [DE/CA]; 4443 West 16th Avenue, Vancouver, British Columbia V6R 3E7 (CA).

(74) Agents: KINGWELL, Brian, G. et al.; Smart & Biggar, Box 11560, Vancouver Centre, 650 West Georgia Street, Suite 2200, Vancouver, British Columbia V6B 4N8 (CA).

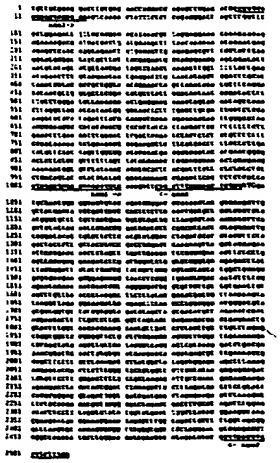
(81) Designated States *(national)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published:
— *Without international search report and to be republished upon receipt of that report.*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: A PLANT LONG CHAIN FATTY ACID BIOSYNTHETIC ENZYME



(57) Abstract: In various aspects, the present invention provides nucleic acid sequence encoding all or part of a new plant long chain fatty acid condensing enzyme (a fatty acid elongase), designated herein as KCS2 (for beta-ketoacyl-coenzyme A synthase 2). In some embodiments, KCS2 may mediate the biosynthesis of C18, C20, C22 and C24 fatty acids. The activity of the enzyme is typically characterized by two carbon (malonyl-CoA) additions to C16, C18, C20 and C22 moieties (C16-C22 acyl CoA molecules), i.e. condensation of malonyl-CoA with a C16, C18, C20 or C22 acyl-CoA. The fatty acids produced by the enzyme may for example be saturated 18:0, 20:0, 22:0 and 24:0 fatty acids. The invention includes recombinant nucleic acid molecules comprising a heterologous nucleic acid coding sequence encoding the plant long chain fatty acid condensing enzyme.

WO 01/07586 A2